Booster Kit Installation Manual

For LEMCO® brushed DC motors

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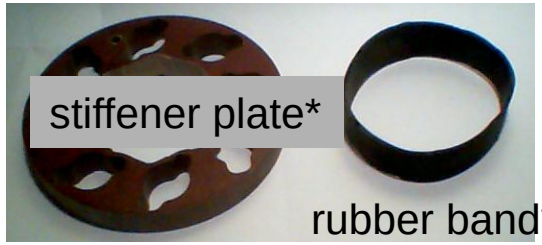
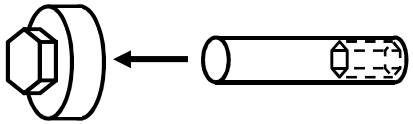
Booster Kit Part List

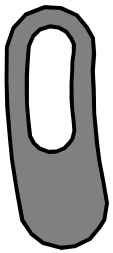


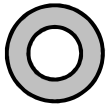
*Obsolete with HD – Kit und TK1/2

4 x nuts with bolts M4

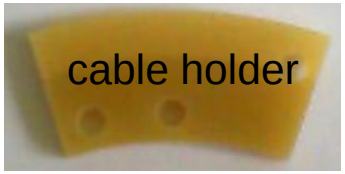


4 x drused washer





4 x adjustment washer



spring

angled bracket

frame washer

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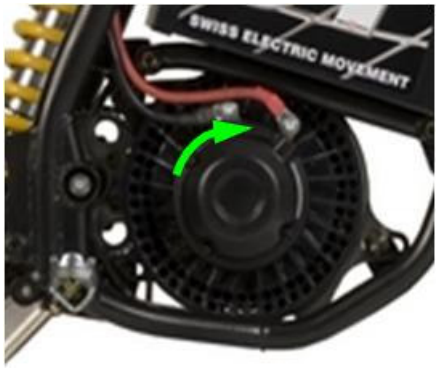
Booster: Restriction of Usage

Important Note: Only use with correct sense of rotation

The Booster Kit is designed for motors that **spin clockwise** when looking onto the brush plate, and must only be used with those. The instructions in this manual are therefore valid for motors with clockwise rotation.



In principle, it is possible to also use it with motors that spin counter-clockwise, which requires some modifications of the Booster Kit.
Please contact picoamps in this case.

If the unmodified Booster Kit is used on motors with wrong sense of rotation there is a risk that the motor will be permanently damaged.

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Mounting of Booster Kit
Dismounting of brush plate

Step 1: Disconnect main power plug from battery!!!

Step 2: Disconnect plug of temperature switch

Step 3: Disconnect power cables and remove cover of brush plate

Step 4: Dismount brush plate (4 x M4 Inbus screws)

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Mounting of Booster Kit
Mounting of Finger Lever and Bowden Cable

Finger Lever

mount finger lever to the left side of the hanlde bar.

We recommend:
monunt the lever for the booster underneath the lever for the rear brake

Warning!
the brake lever the must not be blocked or obstructed by the finger lever for the booster

Bowden Cable

The Bowden cable should be placed under the tank covering avoiding sharp bends and giving sufficient play for moving the handle bar.

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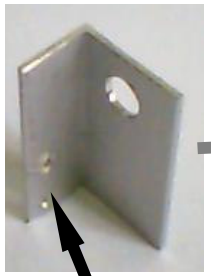
Mounting of Booster Kit
Mounting of angled bracket and frame washer

Step1: Dismount bearer from frame
remove screws on both ends

Step 2: On the left side place angled bracket between bearer and frame.



Step 3: On the right side place frame washer between bearer and frame.

Step 4: Mount bearer to frame
firmly tighten screws on both ends

Step 5: Place Bowden cable into the angled bracket between nut and setscrew.

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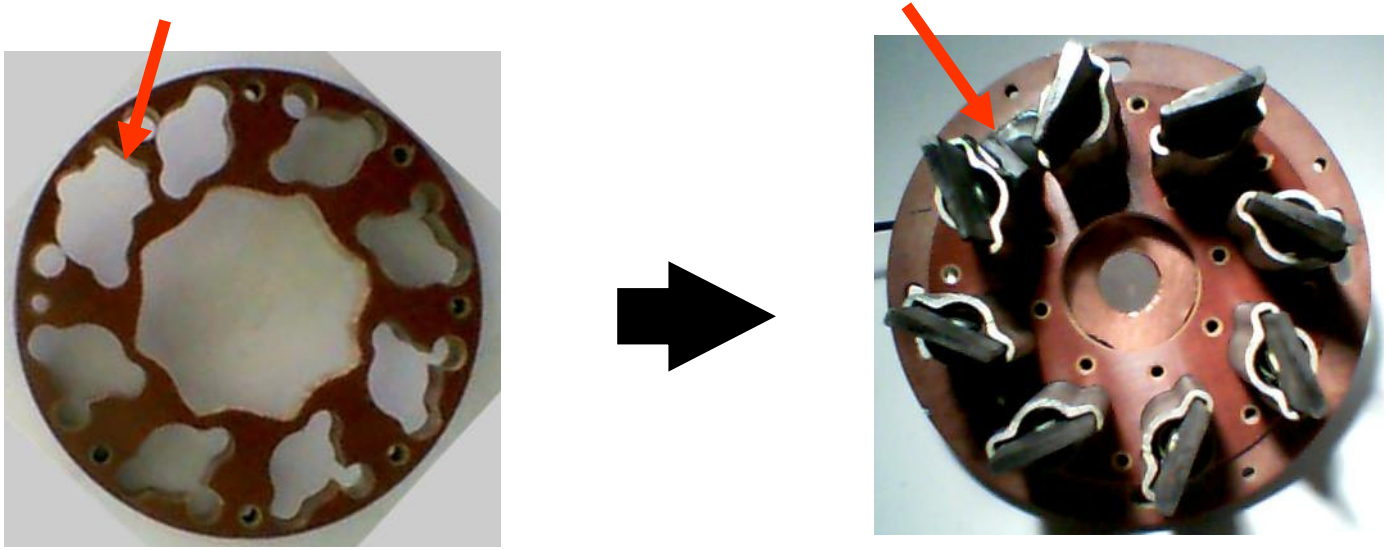
Preparation of the brush plate Step 1

Note: the stiffener plate is already mounted on Heavy Duty Kit or Tuning Kit

Fit the delivered stiffener plate onto the tubes and shift tightly against the brush plate .

Note: One of the eight apertures in the stiffener plate is enlarged to provide space for the thermal switch. Therefore the stiffener plate can only be mounted in one orientation. If the thermal switch is mounted in the wrong position, this has to be corrected in step 2

Enlarged opening for thermal switch



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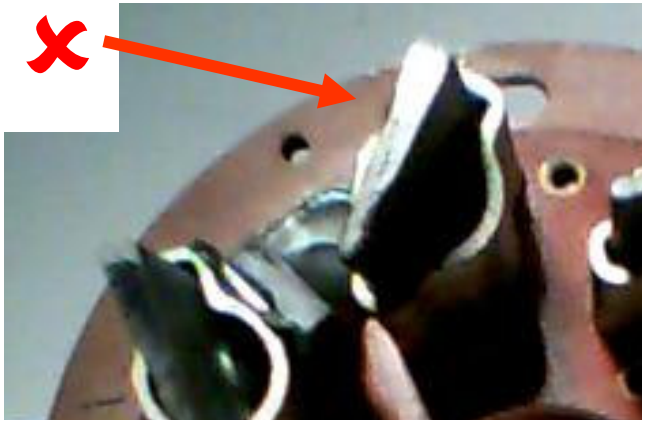
Preparation of the brush plate Step 2

Note: the stiffener plate is already mounted on Heavy Duty Kit or Tuning Kit

On some brush plates the thermal switch is fixed to the outer side of the adjacent brush tube so that the stiffener plate will not fit.

In this case the thermal switch has to be carefully removed using a thin blade.



The thermal switch has then to be fixed onto the inner side of the correct brush tube as shown.

To fix the switch use a two component epoxy glue with a temperature stability of at least 150°C

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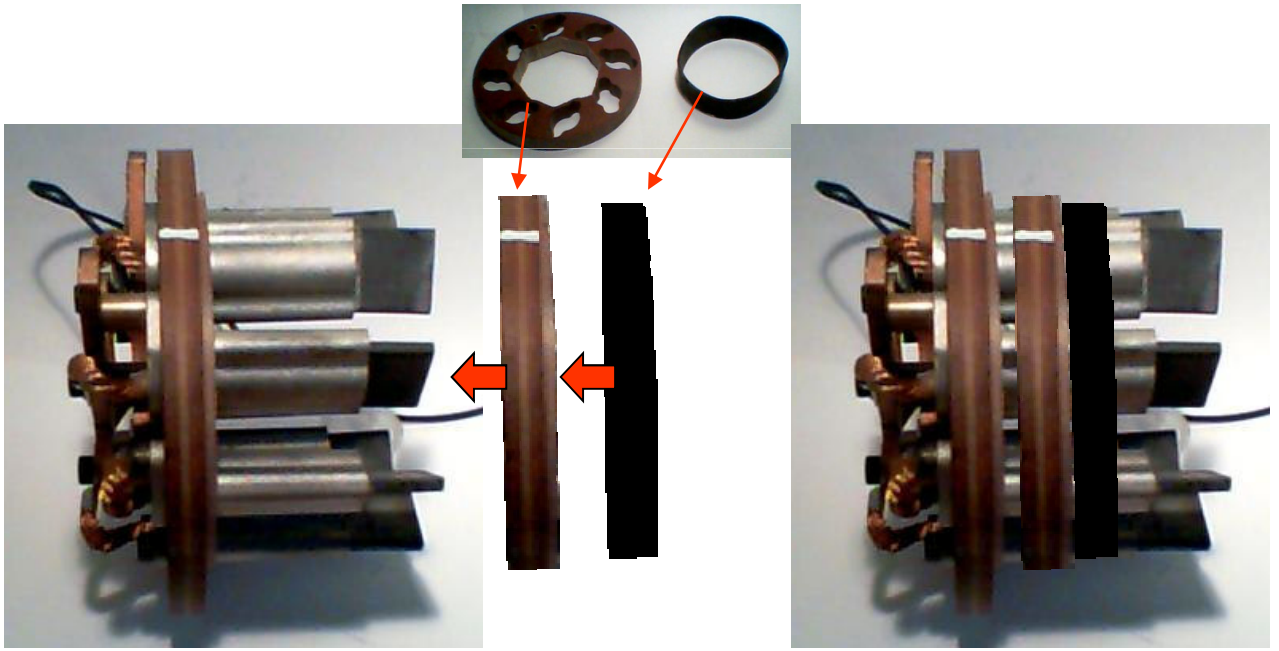
Preparation of the brush plate Step 3

Note: the stiffener plate is already mounted on Heavy Duty Kit or Tuning Kit

Place the delivered rubber ring directly behind the stiffener plate so that the stiffener plate will not slip from the brush tubes.



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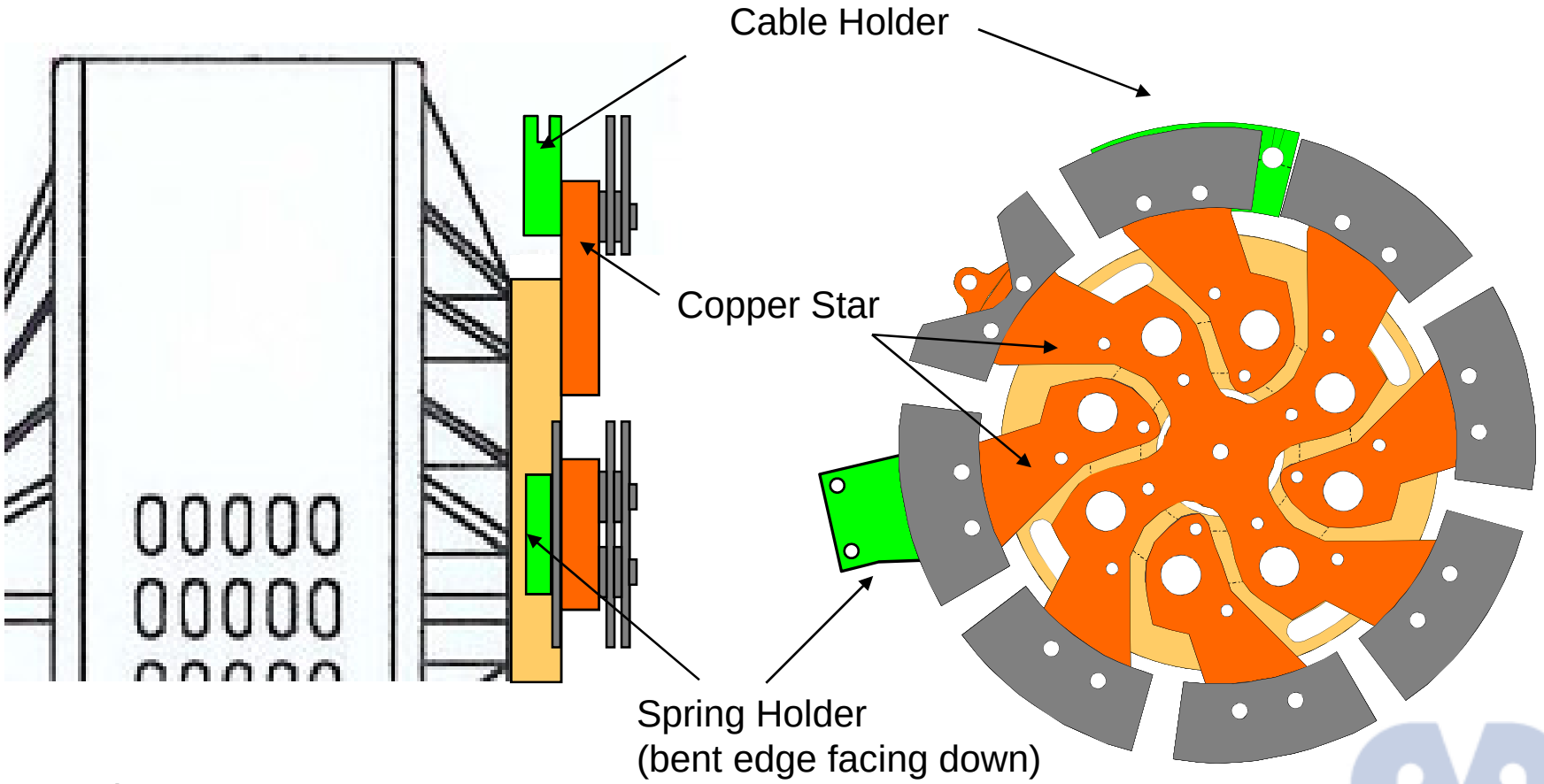
Mounting of Spring and Cable Holder

The delivered spring and cable holder are mounted to the copper star on the side facing toward the motor housing as shown below. Note that a cooling plate is placed between spring holder and copper star.



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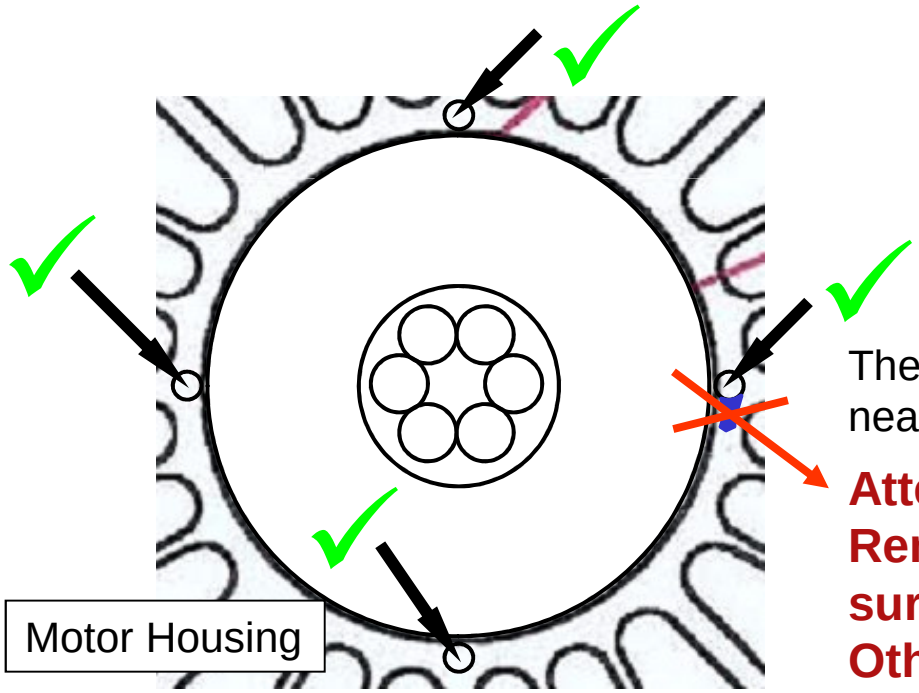
Dispensing the glue to fix the brush plate mounting bolts

Clean and remove grease and oil from the four M4 mounting holes for the brush plate in the motor housing **before** dispensing glue.

To fix the bolts use LOCTITE medium (or strong)

Dispense the glue **into** the M4 holes before mounting the bolts using a suitable tool (e.g. thin stick).



There must be no glue on the motor housing near the thread holes.

Attention!
Remove excess glue on the housing surface.
Otherwise the booster will not work.

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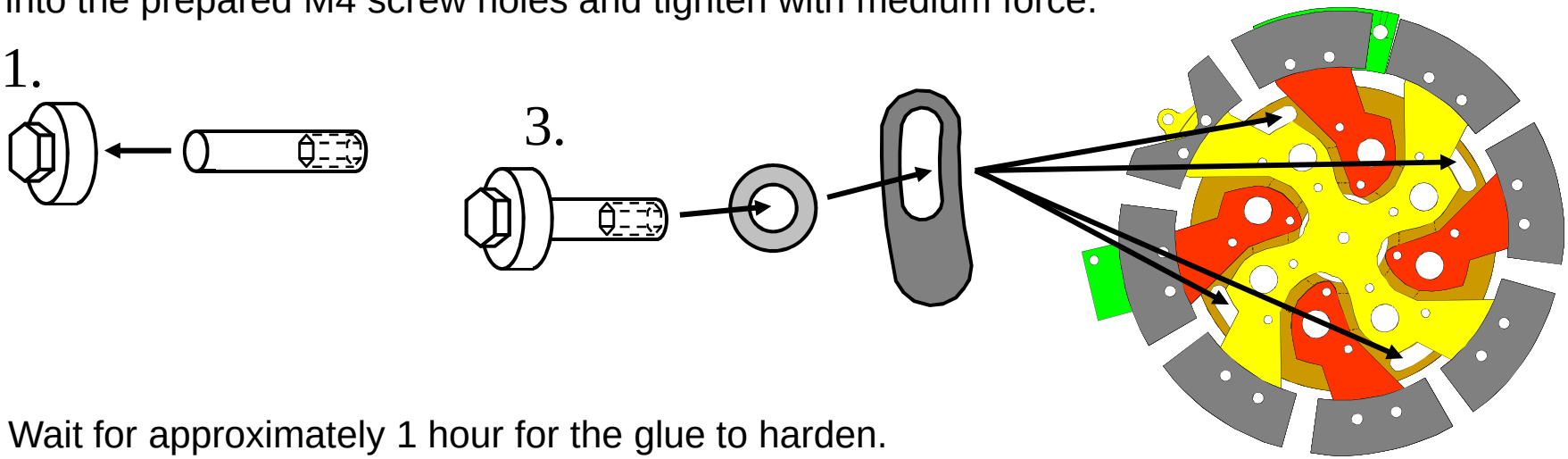
Mounting of the brush plate mounting bolts

Step 1: Insert the bolts into the nuts and fix with medium force
(using a 2.5 mm hex wrench and a 4 mm socket wrench)

Step 2: Place the brush plate in the opening of the motor housing of the without inserting cable and spring.

Step 3: on each bolt slide an adjustment washer and a drused washer and place the bolts into the prepared M4 screw holes and tighten with medium force.



Wait for approximately 1 hour for the glue to harden.

Unscrew the nuts. When removing the nuts the bolts have to remain tightly in the housing.

If one of the bolts is loose the procedure has to be repeated.
Optionally use a stronger version of LOCTITE

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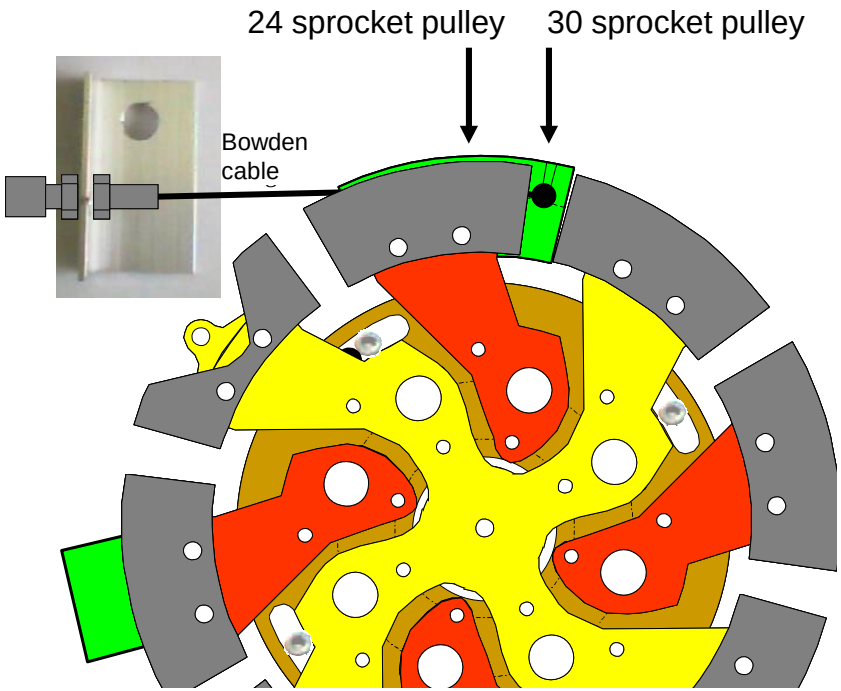
Mounting Bowden cable on brush plate

Step 1: Dismount the brush plate again (the bolts have to stay in the motor housing)

Step 2: Before mounting the brush plate insert the cable into the cable holder.



Note:
Depending on the used belt pulley the position of the motor in the frame is different. Therefore the string holder provides two different fitting holes to fix the cable.

The rear position corresponds to the 24 sprocket pulley and the position corresponds to the 30 sprocket pulley.

Step 3: Place the brush plate with mounted Bowden cable into the motor housing.

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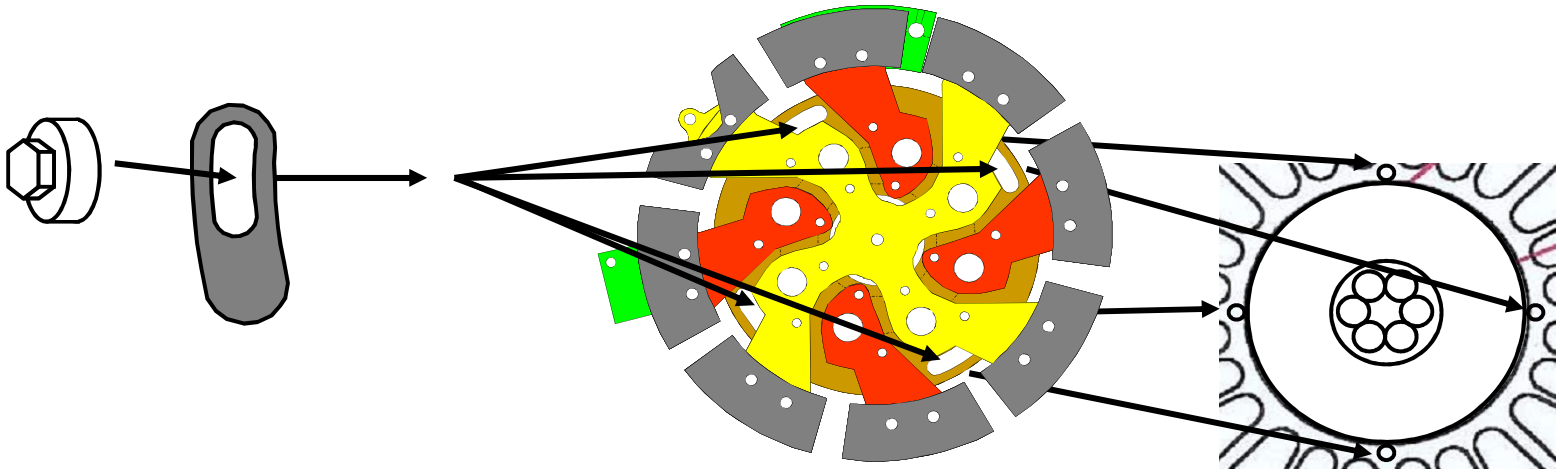
Mounting of the complete Brush Plate

Step1: Place one drused washer in each oval hole.
TAKE CARE OF THE CORRECT ORIENTATION (see also the following safety warning)

Step 2: Tighten the nuts with medium force.

Note:
The adjustment washers are not used for the final mounting of the brush plate. Mount the drused washers only. Due to the removed adjustment washers the brush plate should have an axial play of 0.5 mm at all four nuts when the nuts are



Important: Check that the brush plate does freely rotatate with low friction.

Dispense some grease on the drused washer to reduce the friction for the nut.

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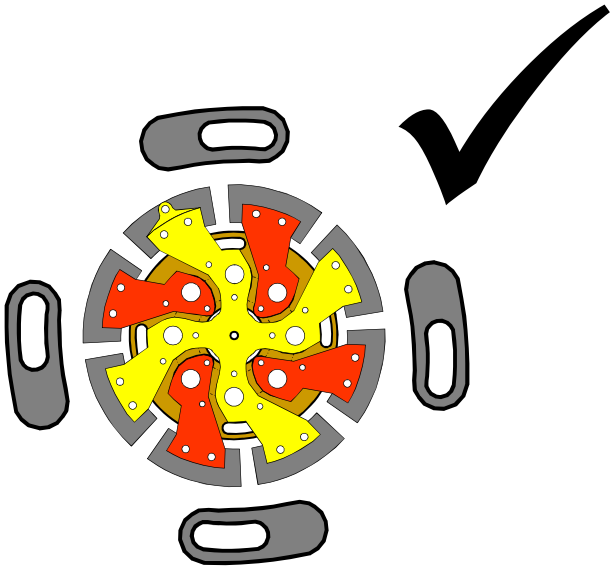
Safety Warning: Orientation of the drused washers

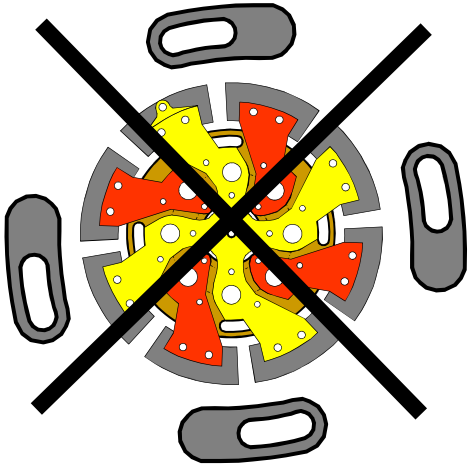
Important:

The drused washers have to be inserted in the correct orientation as shown.



Attention:

With the wrong orientation of the drused washers the motor will be destroyed.



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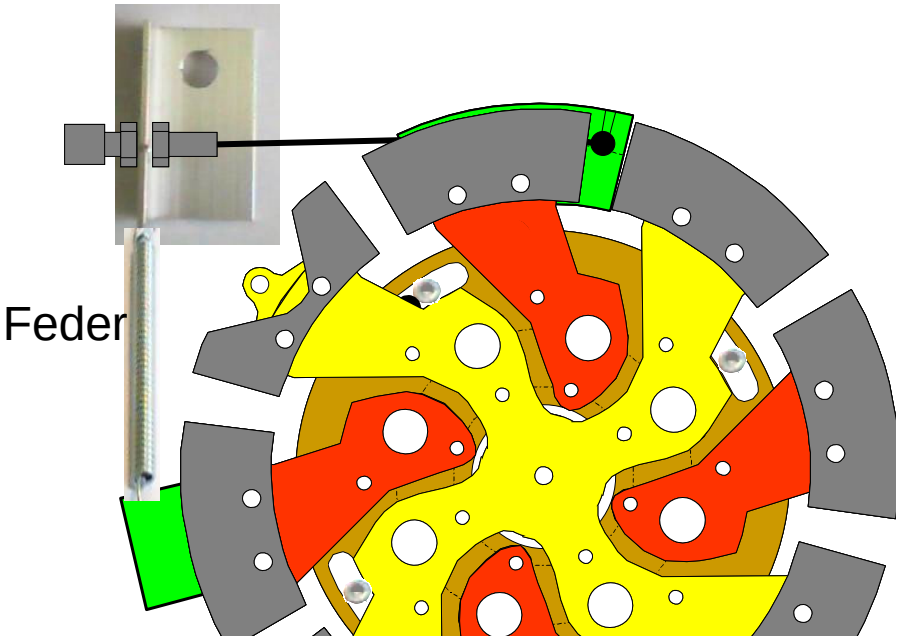
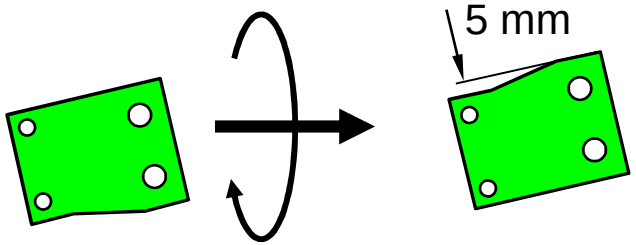
Mount Spring to the Brush Holder

Step 1: Insert the spring at the spring holder and the angle bracket

Step 2: Adjust the play of the Bowden cable such that the full rotation range is used by pulling the finger lever



Note:
The zero force of the spring can be increased when changing the orientation of the spring holder as shown.
Through the asymmetry of the spring holder the spring will receive an additional pre-load of 5 mm (or ca. 14 N)



Important: Make sure that the brush plate is smoothly pulled back to zero position by the spring.

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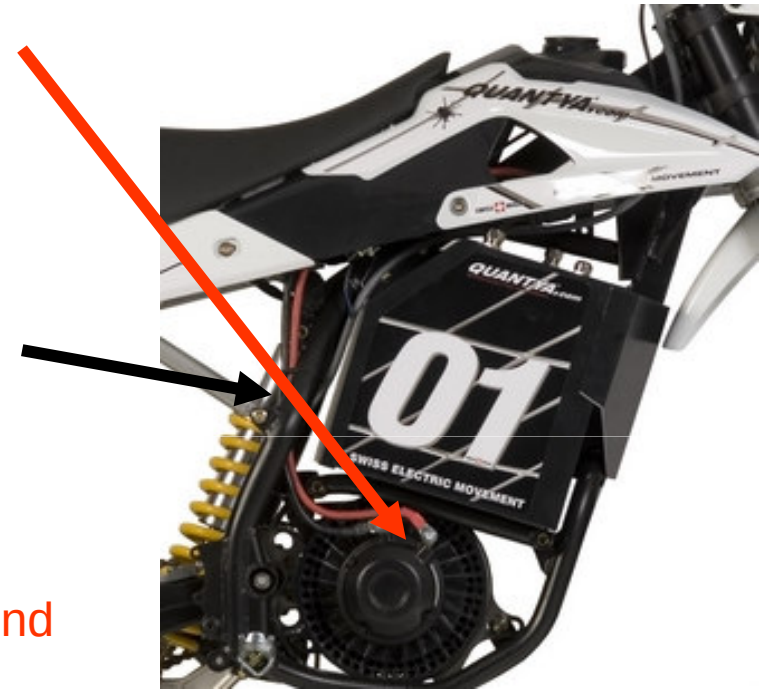
Final Mounting

Connect the power cables to the brush plate and mount the brush plate cover.
Bend the power cables such that the rotation of the brush plate will not be hindered.

Connect the thermal switch

Make sure that motor, transmission and rear wheel are freely rotatable.

One should hear only the **usual** grinding sound of the brushes. Otherwise remove the brush plate to find out the reason.



Connect the main power plug, ready to go!

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